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ABSTRACT

This study examined how relevant cues given by an experimenter might differentially affect the performance of task versus socially oriented children on two games. On the basis of past research, two independent variables were chosen: field dependence-independence and sex. It was expected that field-dependent children and girls would tend to be more socially oriented and therefore more responsive to social cues, while field-independent children and boys would tend to be more task oriented and less responsive to social cues. The results supported the expectations regarding field dependence-independence but failed to support those regarding sex differences. (Author)

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Abstract

This study examined how relevant cues given by an experimenter might differentially affect the performance of task versus socially oriented children on two games. On the basis of past research, two independent variables were chosen: field dependence-independence and sex. It was expected that field-dependent children and girls would tend to be more socially oriented and therefore more responsive to social cues, while field-independent children and boys would tend to be more task oriented and therefore less responsive to social cues. The results supported the expectations regarding field dependence-independence but failed to support those regarding sex differences.

TASK VS. SOCIAL ORIENTATION IN YOUNG CHILDREN AND THEIR ATTENTION TO RELEVANT SOCIAL CUES

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Much of the literature on children's attention to incidental as opposed to focal cues assumes that performance on a task is facilitated by the ability to screen out irrelevant, non-task stimuli (White, 1965; Turnure, 1969). For example, a study by Mondani and Lutko (1969) indicated that underachievers attend too much to incidental, irrelevant material and not enough to the central learning task.

However, other lines of research indicate that attention to incidental cues can have beneficial as well as detrimental effects depending upon whether they are relevant or irrelevant to the task. Ward (1969) found that high creative children gave more responses on an "instances" test in a cue-rich testing environment than in a poor environment, while low creatives showed no such environmental effect. Turnure and Zigler (1964) demonstrated that outer-directedness can facilitate performance on a task when the experimenter provides cues relevant to the task.

The purpose of the present study was to further examine how relevant cues given by the experimenter might serve to differentially facilitate performance on a task by task versus socially oriented children. These predispositions have been previously described (Dreyer & Riger, 1969; Keogh, 1971) as differences in the ways children approach an experimental task. Some children are very attentive to the task, essentially unaware of other stimuli. Others are less attentive to the task and appear to be very much aware of or even dependent upon the experimenter.

It was hypothesized that children particularly sensitive to the social environment would be attentive to cues given by the experimenter during a task situation, while more task-oriented children would be less responsive to these cues. The independent variable chosen to examine this hypothesis was field dependent-independence (Witkin, Dyke, Faterson, Goodenough, & Karp, 1962), since this variable has often been related to a social versus task orientation (Fitzgibbons, Goldberger, & Eagle, 1965; Konstadt & Forman, 1965; Messick & Damarin, 1964). That is, a field-dependent individual is supposedly very responsive to social or evaluative aspects of a task situation, and his performance is influenced to a large extent by these social factors. On the other hand, the performance of field-independent individuals is presumably less affected by social stimuli in the situation.

An additional independent variable was the sex of the child. Numerous studies have reported findings which indicate that females are more "people oriented," while males are more "object oriented" (Garai & Scheinfeld, 1968; Goodenough, 1957). Therefore, it was expected that girls would be more attentive to the experimenter and thus more responsive to any cues the experimenter might provide.

Method

Subjects

The subjects were 28 girls and 28 boys from the second and third grades of a West Los Angeles elementary school. The school is located in a largely middle to lower middle class area. The ages ranged from 7 years 6 months to 10 years 2 months, with a mean age of 8 years 7 months. The subjects were divided into field-dependent and field-

independent groups on the basis of the Gerard Rod-and-Frame Test (Gerard, 1969). Four of an original 60 subjects were dropped by random procedures in order to have equal n's in the sex by field-dependence cells.

Apparatus and Materials

The Gerard Rod-and-Frame Test is a portable version of Witkin's standard test. This test is similar to a portable rod-and-frame apparatus developed by Oltman (1968), which correlates highly (r=.89) with the standard Witkin Rod-and-Frame Test. The test consisted of a box 48 inches long, 18 inches high, and 18 inches wide. A luminous frame was mounted inside one end of the box so that the experimenter could tilt it to the left or right by manipulating a dial on the outside of the box. The rod, in the shape of a man, was mounted at the center of the frame and could be rotated independently of the frame. The experimenter could read the positions of the rod and frame on a protractor-like dial. The subject looked at the rod and frame through an opening at the opposite end of the box.

Two experimental "games" were employed: (1) the squares (concept identification) game and (2) two object-assembly tasks, a modified form of the game used by Turnure and Zigler (1964). The object-assembly tasks were adapted from the face and automobile items found in the Wechsler object-assembly tests. They were the same size as those in the Wechsler and were cut into eight pieces from light, ocher poster board. The squares game consisted of 3 sets of 20 4 x 6 inch cards. On each card was pasted one of three sizes of squares cut from three colors of construction paper -- red, yellow, and blue.

Procedure

All subjects were seen individually in two separate testing sessions, one to administer the rod-and-frame test, and one for the two experimental games. The experimenters were two females. Both were needed to administer the rod-and-frame test, one to help the subject and one to manipulate and read the controls. One experimenter (who was blind to the hypotheses and categories of the subjects) tested all subjects in the experimental sessions.

The rod-and-frame test session only lasted about five minutes. The subject's task was to make the man stand "straight and tall" by turning the dial located beneath the opening at his end of the box. Upon entering the room, the subject was asked to stand straight and tall. He was then told to look inside the "magic box" and describe what he saw -- "a man standing straight and tall." The experimenter then rotated the man, and the subject was given one practice trial, with the frame straight, to make the man stand straight again. Then a blackout baffle was lowered as the test trials began.

The test consisted of four different trial settings, repeated in two blocks. The trial settings were: (a) frame and rod both 28° left of upright, (b) frame 28° left of upright, rod 28° right of upright, (c) frame 28° right of upright, rod 28° left of upright, and (d) frame and rod both 28° right of upright. Between each trial the blackout baffle was lowered so that the subjects could not watch the positions being set.

All subjects participated in the experimental task session within three weeks after testing was completed on the rod and frame. This session lasted about twenty minutes. Each subject was brought individually to the

PS 005669

experimental room and seated across from the experimenter at a small table. Half the subjects received the squares game first, half the object-assembly tasks first.

For the object-assembly tasks (puzzles), the subjects were divided so that there were seven in each of the eight cells of a 3-factor design: Sex x Type of Subject (field dependent or independent) x Treatment (experimental vs. control). Half the subjects were initially given the auto puzzle first; the other half were given the face puzzle first. At this time, the experimental subjects were told:

"Here are some pieces of a puzzle. When you put them together they will make something you know. I want you to put them together as quickly as you can. While you are putting yours together, I will put one together too. But you put yours together as fast as you can. OK?"

The control subjects were told:

"Here are some pieces of a puzzle. When you put them together they will make something you know. I want you to put them together as quickly as you can. Do it as fast as you can. OK?"

While the subject was working on puzzle 1, the experimenter timed his performance and recorded the number of times he glanced away from his task. In addition, with experimental subjects, the experimenter quickly assembled puzzle 2, left it in view for fifteen seconds, then disassembled the figure and left the pieces in view for fifteen seconds. She also made note of whether the experimental subjects' glances were directed at the experimenter only, the puzzle only, or at both. This procedure was repeated until the child finished his puzzle or until three minutes had passed.

After puzzle 1 was removed, the pieces to puzzle 2 were placed in front of the subject and he was told:

"Here is another puzzle to put together as fast as you can. Do it as quickly as you can. OK?"

Again, the experimenter timed the performance and recorded glances.

The subject's task during the squares game was to figure out which square was correct for each of three blocks of trials. The subject began a new block of trials either upon reaching a criterion of five correct in a row or after fifteen trials. The cards were shown to the subject three at a time, representing the three sizes of squares, on a cardboard stand which held the cards at a 45° angle from the table. The cards were in three stacks of twenty and were turned over one at a time across the three stacks. The directions to the subject were as follows:

"Here are three squares. Each time I show you the squares, one is right and the other two are wrong. You job is to figure out which one is right. Each time I show you the squares, you point to the one you think is correct. If you are correct, I will say 'right.' Do you understand? OK. Now if you get several answers right in a row, I may change which square is correct. Then your job will be to figure out what the new right answer is. OK?"

Color, size, and position varied over trials such that the same color or the same size never appeared in the same position more than twice in a row. In the first block of trials, a social cue and a task stimulus dimension (size of square) were redundant; in Block 2, the social cue was correct; and in Block 3, the small square was correct and no relevant social cue was given.

For the social cue, the experimenter repeatedly looked at and leaned very slightly toward the card containing the correct square. During the first block, the social cue was directed at the large square. Thus, the subject could reach criterion either by attending to the social cue or to the task dimension. During the second block, only the social cue was relevant to the right answer, since the correct answer over this block of trials was randomized over the size of the squares. During the third block, no relevant social cue was given; the experimenter looked straight down at the table. Thus, the subject had to pay attention to the task dimension (small square was correct) in order to reach criterion.

Results

The 56 children tested on the rod-and-frame test were divided in half according to total degrees of deviation from the upright. The field-independent group's scores ranged from 5 to 58 degrees (mean=33.6). The range in the field-dependent group was 70 to 282 degrees (mean=160.7). The two groups did not differ significantly in mean age. There were 14 girls and 14 boys in each group. The mean score of the girls (94.6) did not significantly differ from that of the boys (96.9). The correlation of the scores for the first block of 4 trials with those for the second block of 4 trials was 0.92, indicating that the test was quite consistent.

Object-assembly Tasks

The scores for each of the two tasks ranged from 0 to 10, one point given for each piece correctly placed plus one bonus point for completing the task in less than 90 seconds and two bonus points for completing it in less than 60 seconds. An analysis of variance was performed on each of the two dependent measures (performance points and number of glances). Between subjects factors were Sex, Treatment (experimental vs. control),

and Type of Subject (field dependent or independent). A within subjects factor was first and second Tasks. The means and standard deviations for performance points and glances on the two tasks are given in Table 1. For performance points, the effect for Type of Subject ($F = 11.30$, $df = 1, 48$, $p<.01$) indicated that the field independents did better than the field dependents on both tasks. No other effects were significant at $p<.05$.

Insert Table 1 about here

The analysis of number of glances gave significant main effects for Treatment ($F = 14.02$, $df = 1, 48$, $p<.001$), Type of Subject ($F = 6.08$, $df = 1, 48$, $p<.05$), and Tasks ($F = 39.00$, $df = 1,48$, $p<.001$). Table 1 shows that the experimental subjects glanced more than the control subjects; field dependents glanced more than field independents; and there was more glancing on task 1 than on task 2. There was also a significant Treatment x Task interaction ($F = 16.23$, $df = 1, 48$, $p<.001$) which indicated that experimental subjects glanced more on the first task relative to the second than did the controls.

Squares Game

The mean trials to criterion scores for the field independent and field-dependent boys and girls over the three block of trials are shown in Figure 1. A four factor, Sex x Treatment x Type of Subject x Blocks of Trials, with repeated measures on Blocks, analysis of variance was applied to the trials scores. Only the Blocks main effect was clearly significant ($F = 29.32$, $df = 2, 104$, $p<.001$). This effect was almost wholly accounted for by the scores in Block 1 differing from the other two. There were, however, two interesting trends that approached significance. These can be seen in Figure 1. First, girls tended to do better overall than boys

($F = 2.82$, $df = 1, 52$, $p < .10$). Second, there was a Type of Subject x Blocks interaction ($F = 3.02$, $df = 2, 104$, $p = .06$) such that the means for the field-dependent and field-independent subjects' trials scores reversed from Block 2 to Block 3. The actual means were: for field independents, Block 2 = 16.9, Block 3 = 15.9; and for field dependents, Block 2 = 14.5, Block 3 = 17.2. Thus the field-dependent subjects tended to do better, although not significantly so, when the social cue was relevant (Block 2) than in the condition where the social cue was absent and only the logically correct dimensional cue was present (Block 3). The converse tended to occur in the field independents.

Insert Figure 1 about here

Separate analyses within each of the 3 blocks revealed that the greatest differences occurred on Block 2 for both Sex ($F = 4.00$, $df = 1, 52$, $p < .10$) and Type of Subject ($F = 3.36$, $df = 1, 52$, $p < .10$). Girls were able to utilize the social cue more readily than were boys, and field dependents tended to utilize it more readily than field independents.

According to the hypotheses of the study, it would be expected that of the four Sex x Type of Subject groups, the field-dependent girls would be most responsive and the field-independent boys would be least responsive to the social cue. This was, in fact, the order found in the results, as shown in Block 2 of Figure 1. The difference between these means was significant ($t = 2.62$, $df = 52$, $p < .02$).

Discussion

Unlike most previous studies, no sex difference in field dependence-independence was observed. Furthermore, there was only slight evidence

in support of the expectation that girls were more responsive to social than to task stimuli than were boys. There were no sex differences in frequency of glancing or utilization of the social cue during the object-assembly tasks. Although girls did perform better than did boys on the social cue part (Block 2) of the squares game, this did not clearly reflect a social orientation since girls also tended to be better on the task cue (Block 3).

There were differences in responsivity to social cues between field-dependent and -independent children. The field dependents glanced more than the field independents. This is consistent with the previous findings and the expectations in this study that field dependents were more socially oriented. However, the most striking observation from the results was the differential performance of these two groups on the object-assembly and squares games. The field-dependent children did glance more than the field-independent children. But contrary to expectation, the field dependents did not better utilize the information for solution of the second puzzle that was given by the experimenter during the first object-assembly puzzle. That is, exposure to the second task did not seem to differentially facilitate their performance on that task. The field-independent children did obviously better than the field dependents on both object-assembly tasks. This performance difference is consistent with studies that used the same tasks (Ruble & Nakamura, 1971) and with those that used similar tasks (Witkin et al., 1962). In contrast, the usual superiority of field independents did not occur and in fact was nearly significantly reversed on the social cue block of the squares game.

Thus, it appears that the social cue alone given during the second block of the squares game was more relevant to the field-dependent children than were the cues given during the object-assembly tasks. The most obvious reason for this difference is that in order to notice the cue in the squares game, the child had to watch the experimenter's face; whereas to gain from the cues in the object-assembly tasks, the child had to watch the puzzle the experimenter was making. It appears that the more socially oriented field-dependent children were more likely to watch the experimenter's face than to watch what she was doing with her hands.

Some support for this explanation was available from the recordings of direction of glances taken by the experimenter during the object-assembly tasks. Field-dependent children tended more often to glance at the experimenter, while field-independent children tended more often to glance at the puzzle. In addition, of the eight children in both groups who glanced only at the puzzle and not at the experimenter in the object-assembly tasks, only one reached criterion on the social cue block of trials in the squares game. This proportion is quite small relative to the nearly 50% of all the children who reached criterion on this block of trials. This comparison provided some validation across types of tasks.

The combination of findings in the object-assembly tasks: that there was more glancing during the first task than during the second task, that the field-independent subjects tended to glance at the experimenter's puzzle more than at the experimenter's face, and that the field independents performed better than the field dependents on the tasks, suggests that the glancing by the field independents was primarily a task oriented, information seeking behavior rather than a socially oriented responding.

Thus, the overall results indicate that the amount of glancing per se does not predict a child's ability to utilize a social cue. Rather, it depends on where the child's glancing is directed and whether or not the cue given is relevant. The cue given during the object-assembly task was relevant only for those children who glanced at the puzzle, not at the experimenter. On the other hand, the cue given during the squares game was relevant for the children who were attending to the experimenter.

At least two implications may be derived from these findings. One pertains to several earlier conclusions about relatively poor task performance of field-dependent subjects (Witkin, et al., 1962) and some negative connotations of field dependents (Spotts & Mackler, 1967). The results of the present study indicate that field-dependent subjects may be more effective in tasks or situations that involve relevant social cues. Thus, it is perhaps inappropriate to refer to one cognitive style as more desirable than the other. Which style is more effective may vary with situational factors.

A second implication is in regard to the most effective teaching procedures for social versus task oriented children. The former may respond best in situations that include social cues and reinforcers. As others have suggested, a child's glances away from the task may represent instances of help-seeking, as opposed to inattentiveness (Turnure, 1970), and as such may indicate optimum moments to teach.

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TABLE 1

Means and Standard Deviations of Points and Glances on the Two Object-Assembly Tasks (n=7 per cell)

Group		Points		Glances	
		Task 1	Task 2	Task 1	Task 2
Control					
Field-dependent					
Boys	Mean	4.4	4.4	1.6	0.4
	S.D.	2.6	2.4	1.1	0.8
Girls	Mean	3.6	4.6	2.1	1.3
	S.D.	2.1	3.2	2.0	1.6
Field-independent					
Boys	Mean	5.7	6.0	1.3	1.0
	S.D.	2.7	2.8	1.3	1.5
Girls	Mean	5.0	7.4	1.4	0.6
	S.D.	2.4	2.7	2.1	1.0
Experimental					
Field-dependent					
Boys	Mean	5.9	3.7	5.3	3.7
	S.D.	3.4	2.9	5.1	1.1
Girls	Mean	3.4	4.9	6.4	1.4
	S.D.	3.0	2.5	2.1	1.6
Field-independent					
Boys	Mean	6.6	6.7	0.9	0.4
	S.D.	3.6	2.1	2.3	1.1
Girls	Mean	6.6	6.9	2.6	0.7
	S.D.	2.1	2.7	1.5	0.6

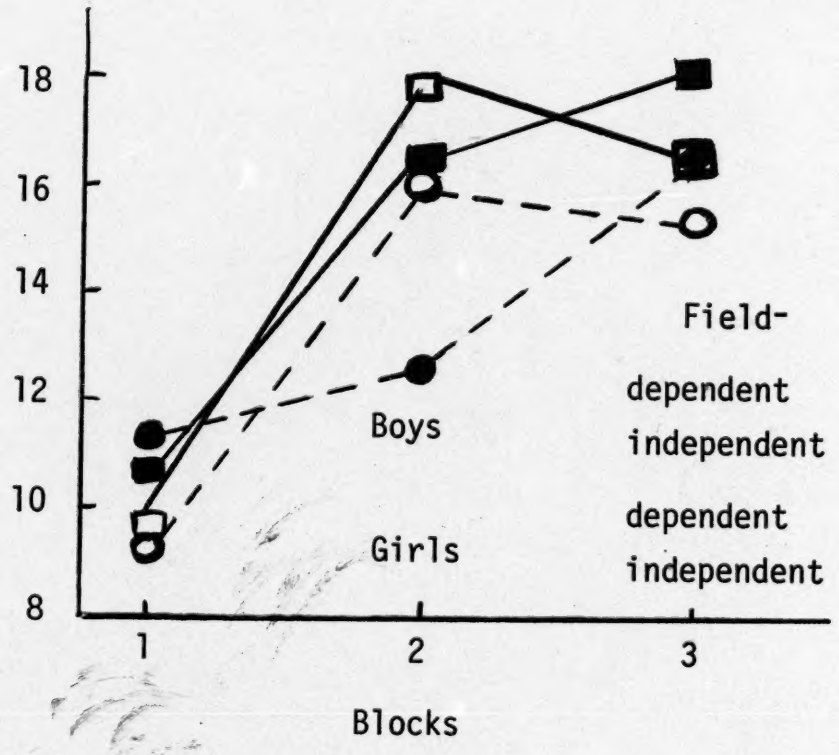

Figure 1. Mean trials to criterion as a function of sex, field dependence-independence, and blocks of trials on the squares game.